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PROVISIONAL APPLICATION FOR PATENT COVER SHEET

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XYP-001PR

First Named
Inventor

Eveleth

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This is a request for filing a **PROVISIONAL APPLICATION FOR PATENT** under 37 CFR 1.53(c).

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(City and either State or Foreign Country)

Mountain Lakes, NJ

TITLE OF THE INVENTION (280 characters max)

Sailing Craft with Wheels

ENCLOSED APPLICATION PARTS (check all that apply)

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| <input checked="" type="checkbox"/> Specification (Number of Pages 15) | <input type="checkbox"/> CD(s) (Number) |
| <input checked="" type="checkbox"/> Drawing(s) (Number of Sheets 5) | <input checked="" type="checkbox"/> Application Data Sheet |
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METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT

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The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.

- ☒ No.
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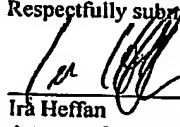
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APPLICATION DATA SHEET**Application Information**

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City of Mailing Address::

State or Province of Mailing Address::

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**Provisional Patent Application for
Sailing Craft with Wheels**

Field of the Invention

[0001] The present invention is directed to the field of water craft. In particular, the present invention is directed to a sailing craft with wheels.

Background

[0002] Youngsters often start to learn to sail when they are eight to ten years old. Unfortunately many of the boats used to teach them are either difficult to handle, too heavy, too complex or not fun to sail. Traditional sailboats for youngsters generally fall into three categories: sailing dinghies, small single-handed boats (primarily designed for adults), and small catamarans.

[0003] Sailing dinghies, such as the OPTIMIST, available from Vanguard Sailboats of Portsmouth, Rhode Island, are small, relatively light, and not easily tipped over, but they are complex to sail, and also are slow. Also, youngsters outgrow them all too quickly because they are small.

[0004] Single-handed boats, such as the SUNFISH or LASER, also available from Vanguard Sailboats, are faster and fun, but are often too heavy for small children. Further, they can be difficult to land at a beach because their centerboards and rudders must be retracted. They also can tip easily in gusty winds because they have rounded bottoms and no keels. This sometimes scares young sailors.

[0005] Small catamarans, such as the HOBIE WAVE, from Hobie Cat of Oceanside, California, are a favorite for young sailors because they are

fast, but they can be difficult to turn. They turn more easily if two sails are used, for example a mainsail and a jib, but this requires two sailors and skill. Unlike sailing dinghies, catamarans can be sailed by several children, and they are easily beached. But even the smallest of the small catamarans can be too heavy for some youngsters. However they do not tip over as easily as the single-handed boats because they do not have rounded bottoms.

Summary of the Invention

[0006] The present invention relates to a sailing craft, such as a sailboat, which is simple, light-weight, fun, and fast.

[0007] In general, in one aspect, the invention relates to a boat that has features optimized for use by children. The boat is light, weighing about the same amount as a young sailor. The boat is simple to operate, with no centerboard to lift when coming onto shore, and no rudder to submerge when leaving the beach. The boat also does not tip as easily as a single-handed boat such as the SUNFISH. The boat can sail fast in moderate winds, and is stable and can be controlled easily in heavy winds. Further, the deck is a trampoline that can be occupied by one, two or several children.

[0008] In one embodiment, the boat is a small catamaran-type boat, in the sense that there are floats that support a deck, but the two hulls of a conventional catamaran are replaced by buoyant wheels. For example, in a preferred embodiment, there are four buoyant wheels, one wheel in each corner of the boat.

[0009] In a conventional boat, floatation is provided by one or more hulls, steering by a rudder, and tracking (i.e., going straight forward when the wind is from the side) by a centerboard or keel. In embodiments of the

invention, the functions of floatation, steering and tracking can be performed by the wheels, in addition to or instead of one or both of a centerboard and keel. Specifically, floatation is provided by the buoyancy of the wheels, and steering is accomplished by turning two wheels, for example the front two wheels as in an automobile. Tracking is provided by the other two wheels while turning and by all four while going straight.

[0010] In a preferred embodiment, each wheel is equipped with a circular fin around its perimeter which acts like a keel or rudder, depending on the wheel's location. For example, if the forward wheels can be turned as just described, fins on the forward two wheels can act as a rudder. If the aft two wheels are held straight, the fins on the aft two wheels can act as a keel. Fins on the wheels thus can help the wheels provide steering and tracking.

[0011] In one embodiment, the fins on the wheels are sufficiently narrow such that they dig into beach sand and prevent the boat from proceeding any substantial distance up the sand when beaching. This is a safety feature that is useful when the boat is controlled by children.

[0012] In another aspect, a sailboat with four or more wheels serves as a performance sailboat, with such features as an increase in size to carry a crew of two or more, additional sails such as a jib and or spinnaker, and in some embodiments arranging the four wheels in a diamond formation rather than a rectangle.

[0013] In general, in one aspect, the invention relates to a sailing craft, such as a sailboat, having a frame, a sail affixed to the frame, and four or more buoyant wheels. Two or more buoyant wheels are attached to one side of the frame, and two or more buoyant wheels attached to the opposite side of the frame. The frame can be constructed of aluminum or fiber re-enforced resin. In one embodiment, the frame has four sides and has a

rectangular shape. The frame can also be square, or can have another shape, for example, a pentagon, or trapazoid.

[0014] Each wheel can have one or more fins on some or all of its perimeter. Each wheel is capable of contributing to at least one of floatation, steering, and tracking. The wheels can be, for example, inflatable rings or inner tubes. The wheels can be made of rubber, or for example, plastic foam. The wheels can be spring loaded. The wheels can be in the shape of spheres and ellipsoids.

[0015] In one embodiment, the sailing craft has three or more buoyant wheels attached to one side of the frame; and three or more buoyant wheels attached to the opposite side of the frame. At least one of the wheels on each side of the craft is used for steering, and at least one of the wheels on each side of the craft is used for tracking.

[0016] In another aspect, the invention relates to a sailboat including a frame in the form of a cross. One or more of the buoyant wheels are attached to each end of the cross.

[0017] The foregoing and other objects, features and advantages of the present invention, as well as the invention itself, will be more fully understood from the following description of preferred embodiments, when read together with the accompanying drawings.

Brief Description of the Drawings

[0018] The drawings are exemplary, and are not necessarily to scale, emphasis instead being placed on describing features of the invention:

[0019] FIG. 1 is a view of an embodiment of the invention showing the deck and cockpit floor trampolines in place.

[0020] FIG. 2 is a view of the embodiment of FIG. 1 with the trampoline missing to reveal the boat's frame.

- [0021] FIG. 3a- FIG. 3d show embodiments of wheels.
- [0022] FIG. 4a – 4f is a flat view of a frame and steering mechanism in an embodiment of the invention.
- [0023] Fig. 5a-5b is a detailed view of the embodiment of FIG. 4A-4F showing the section of the frame at the aft end of the cockpit.

Detailed Description

- [0024] Referring to FIG. 1, a four-wheeled sailboat 100 is designed to be a single-handed sailboat that can be controlled by one sailor, and which handles like other conventional single-handled sailboats in many respects. Unlike most catamarans, however, the boat 100 is narrow so that it can heel slightly to leeward somewhat like a mono-hull. Thus, youngsters who learn to sail on this boat will adjust easily to sailing mono-hulls later in their sailing careers. In addition, youngsters enjoy hiking out in a stiff breeze as the boat begins to heel. These activities are facilitated by a narrow boat.
- [0025] There is a deck trampoline 101, which is made of polypropylene Permatron fabric manufactured by Permatron Corporation, 1180 Pratt Ave., Elk Grove Village IL 60007. The eyelets and tools for installation are available from Hobie, 4925 Oceanside Blvd., Oceanside CA. The deck trampoline 101 is attached to the frame, described below. In some embodiments, and unlike most conventional small catamarans, the boat 100 includes a bottom trampoline 102 measuring about 20 inches wide by 30 inches in a preferred embodiment. With this, in combination with a somewhat smaller hole in the deck trampoline 101, a small cockpit 103 without sides is formed. The sides are omitted so that the skipper can sit on the deck trampoline 101 next to the cockpit 103, and when

it is necessary to hike out in a heavy breeze, he can brace himself by hooking his feet under the edge of the cockpit 103. (The skipper of the boat is referred to here as male, although the invention is equally useful for male or female sailors.)

[0026] When on starboard tack, the skipper will generally hold a mainsheet 104 in his right hand and a tiller extension in his left hand. Pulling the tiller extension 105 towards him, to starboard in this example, steers the boat to port as in a mono-hull.

[0027] The Mast and Sail

[0028] Referring to Figure 2, a sail 201 is affixed in conventional manner to a mast 202 and boom 203. The mast 202 and sail 201 can follow conventional design guidelines. The mast can be, for example, 20 feet tall and made from carbon fiber re-enforced resin, of the sort available from Van Dusen Racing Boats, 277 Baker Ave., Concord MA 01742. The sail can be made from Dacron sailcloth and can be the sort obtained, for example, from Doyle Sailmakers, 89 Front Street, Marblehead MA 01945.

[0029] The mast is held in place by a conventional step 207, mounted on the frame 209. The step holds the mast in place on the frame 209, and can be equipped with provision for the mast to rotate as the sail is pulled in and out. A forestay 204, a starboard shroud 205 and port shroud 206 hold the mast upright. These can be of the type commercially available, for example from Rig-Rite, Inc., 63 Centerville Road, Warwick RI 02886.

[0030] The sail is also held in place by main sheet 208 which is attached to the frame 209 at a traveler 210 and passes through blocks 211, 212 and 213.

[0031] This hardware is commercially available, for example, from Harken USA, 1251 East Wisconsin Ave, Pewaukee, Wisconsin 53072. The

skipper can adjust the position of the sail by pulling or loosening the sheet 208. The position of the sail can further be adjusted by sliding the traveler 210 to starboard or to port.

[0032] As shown, the boat floats on four freely turning front wheels 214, and freely turning back wheels 217. As shown, each wheel 214 and 217 has a fin 215 extending outward from its perimeter. The fins on the forward two wheels 214 act as rudders, and the fins on the aft two wheels 217 act as keels.

[0033] The boat is steered using the tiller 218 and tiller extension 219. The tiller is attached to a tiller post 220 which operates the mechanism which controls the turning of the wheels. Tiller and tiller extensions are commercially available, and can be obtained, for example, from Layline, 1401 Capital Blvd., Raleigh NC 27603. The turning mechanism is located below the frame and is described in more detail below. Vertical struts 221 are located at various places in the frame to strengthen it. These can be 1/8 inch thick right angle aluminum extrusions with 1/2 inch legs, available, for example, from Midland Aluminum Corporation, 4635 West 160th St., Cleveland OH 44135.

[0034] The Wheels

[0035] Referring to FIG. 3a (end view) and FIG. 3b (side view), in one embodiment, a wheel includes three principal parts: a body 312, a rim 304 and a fin 305. As shown, the body 312 is in the shape of a donut or torus.

[0036] In a preferred embodiment, the body 312 is a rubber inner tube, such as Part #TUB420 from Hanco Corporation, 3650 Dodd Road, Eagan MN 55123-1305. When inflated to size, this inner tube has an outer diameter of approximately 40 inches and an inner diameter of approximately 12 inches and a body diameter of approximately 14 inches. These

dimensions were selected so that with a crew consisting of a young skipper, the wheel will float high enough to provide low resistance to the forward motion of the boat. Other sizes can be used as well. Also, the wheels can be made of, or include, other material, such as light weight foam, so that they do not sink if punctured.

[0037] The hub 302 can be any lightweight wheel assembly. A bicycle-wheel-type assembly is suitable, for example, and also includes the ball bearings and axle. In such case, the rim 304 is a twelve-inch bicycle rim which is attached to the tube with adhesive.

[0038] The fin 305 protrudes from the body 312. As shown, a single fin 305 extends from the outside perimeter of the body 312, is circular or ring-like in shape. The fin 305 can be manufactured as part of the body or separate from the body 312, and if it is separate it is attached later. The fin 305 can be attached, for example, by some combination of adhesive, air pressure when the wheel body 312 is inflated, and/or other means, and can be attached directly to the outside perimeter, or attached to the side of the body 312 or even to the rim 304.

[0039] In a preferred embodiment, the fin 305 has an inner diameter of approximately 40 inches and an outer diameter of approximately 48 inches and is made from a fiber glass re-enforced resin. To aid in holding the fin in place, the wheel body 312 in the form of an inner tube is inflated to slightly more than 40 inches, but is constrained in expansion by the fin. The fin is also held in place by an adhesive such as used to repair punctures in inner tubes. Fiber glass re-enforced resin materials can be obtained from Fibre Glast Development Corporation, 95 Mosier Parkway, Brookville OH 45309.

[0040] The fins on the front and aft wheels in the preferred embodiment have the same inner and outer diameters and are designed so

that the submerged area of the two fins on the front wheels is approximately the same as the area of a rudder for a conventional boat of similar size. The area of the submerged fins on the back wheels have approximately the same size as a centerboard on a conventional boat of similar size. The fins could instead have different shapes and sizes. For example, other embodiments can use larger fins in front or aft, depending on whether turning or tracking is emphasized. The fins are thin so that they displace only a small amount of water, since increased displacement slows down the boat. The fins are also useful to provide a braking action when the boat runs up on a sandy beach. Fins of softer material such as rubber may be substituted if it is desired to reduce the possibility of injury to persons on the beach if struck by the boat riding up on shore. However, if the fins bend, it can be detrimental to the tracking and steering functions. Also, in some embodiments, more than one fin can extend from a single wheel. In such case the fins can be the same or a different size.

[0041] The upper half of FIG. 3a, shown above dotted line 311, is a cut-away view of the wheel. The shaded area 310 is the interior of the inner tube.

[0042] The wheel is designed to submerge into the water up to the water line 306. This point is where the profile of inflated portion of the tube is similar to the hull of an ordinary boat. The weight of the boat and the skipper is designed to be or less than equal to the weight of the submerged volume of the four wheels in this situation. As the boat accelerates through the water, the wheels plane, e.g., begin to rise out of the water, and submerged depth, width and length all decrease which reduces the water's resistance to forward motion.

[0043] The Frame

[0044] Referring to FIG. 4f, the construction of an embodiment of a frame and steering mechanism are shown as seen from underneath the frame. The forward most wheels 401 are shown turned at a 45 degree angle. They are also shown in cross section to reveal the rims.

[0045] The frame 402 is constructed of aluminum. Other strong, lightweight materials, for example such as fiber re-enforced resin, could also be used. The perimeter of the frame uses an 1/8 inch thick aluminum right angle with legs of one and one and a half inches, which can be obtained from Midland Aluminum Corporation, 4635 West 160th St., Cleveland OH 44135. The cross pieces 403 use the same material. The frame also contains "T" extrusions 404 which run fore to aft. These are also 1/8 inch thick and are 1-1/2 wide and 1-1/2 deep. The extrusions going across the boat and down the boat are bolted together with standard stainless steel machine screws and nut with nylon locking inserts or are welded together. The outside extrusions form a rectangle seven feet long and four foot eight inches wide in the preferred embodiment. The depth of the frame is eight inches and the axles for the wheels are four inches down from the deck. This arrangement, in most conditions prevents waves from splashing on the deck or in the cockpit.

[0046] Figure 4d shows the detailed construction of the cross brace 405 at the back of the cockpit 406 viewed from the top and Figure 4e shows this structure viewed from the back of the boat. Enlarged views of this structure are shown in Figures 5a and 5b. The structure is along the lines of that used in bridges, and uses braces 501 which are 1/8 inch right angle aluminum extrusions with legs 1/2 long.

[0047] Steering

[0048] FIG. 4f also shows the steering mechanism shown from the underside of the frame. The steering mechanism consists of a pulley wheel 407 which is connected to a rod 408, also shown in Figure 4c. FIG. 4c is side view of the aft portion of the steering mechanism. The rod runs through ball bearings on the cross brace 403 and the one above it 413. The end of the rod is attached to the tiller 409 which in turn is affixed to a tiller extension 410. When the wheel 407 is turned counter-clockwise as viewed from the underside of the frame, it causes a rope wire cable 411 to move in the direction indicated by the arrows 414.

[0049] One of the significant advantages of a frame such as that described as a preferred embodiment is the that it can be manufactured less expensively than normal hulls such as those made from fiberglass-epoxy of wood. Fiberglass epoxy and wood are expensive materials and require considerable effort to form.

[0050] The cable 411 is attached to the steering mechanism at the bow of the boat. This mechanism consists of four pulley wheels 412. As with the pulley wheel 407 near the stern of the boat, these wheels 412 are attached to rods which run through ball bearings mounted on cross braces as shown in Figure 4b. Figure 4a shows the central two cable wheels as viewed from the front of the boat. When the tiller is pulled, the cable which connects the wheels causes the floatation wheels 401 to turn thereby turning the boat.

[0051] The frame is designed to be as light as possible. In other embodiments the frame could be made of fiber re-enforced resin or other light material rather than aluminum. Unlike other boats, the weight of the body of the boat does not participate in the boat's operation. The purpose of the frame is to support the trampoline on which the skipper resides, and to

provide a means to mount the mast and to operate the sails and steering mechanism.

[0052] Other Embodiments

[0053] Variations, modifications, and other implementations of what is described herein will occur to those of ordinary skill in the art without departing from the spirit and the scope of the invention. For example, while embodiments described above provide a boat which is useful for teaching a youngster to sail, variations directed to other applications have these same and other benefits.

[0054] The capacity of the boat can be increased, for example, so that it can accommodate a number of crew members, for example, three or more sailors. This could be accomplished by increasing the size of the frame, mast, wheels and sails. A larger boat could also include a jib and means to accommodate a spinnaker. Likewise, the boat can have increased dimensions in some, but not all areas.

[0055] In another variation, the wheels are arranged at the points of a diamond shape rather than a rectangular one. In this embodiment the invention is a variation of a trimaran and the frame takes the form of a cross. The forward-most and aft-most wheels take the place of central hull, while the other two wheels act as outriggers. This configuration has the advantage of allowing the crew to move out to the windward outrigger in heavy breezes to keep the boat from tipping over, thereby increasing maximum speed. This craft then becomes a high performance sailing craft particularly if equipped, for example, with a bowsprit, jib and asymmetrical spinnaker.

[0056] In yet another variation of the embodiment of Figure 1, additional wheels are used between the forward and aft wheels on each side. Since they would not be needed to perform the functions of tracking and

steering, the fins could be deleted. The advantage of additional wheels is that each wheel could now be smaller since the buoyancy required of the boat would be divided among more wheels.

[0057] Figures 3c and 3d illustrate an alternative design of the wheel. The wheels are not intended to submerge further than the water line 306. Thus the inner part of wheel serves no purpose. If it is eliminated, the wheel will present less wind resistance and the boat will sail faster.

[0058] In another embodiment the steering mechanism can turn both the forward-most and aft-most wheels, one pair clockwise while the other counterclockwise or vice versa. This enhances the invention's turning ability.

[0059] In another embodiment, the wheels are spring mounted to reduce drag caused by plowing into waves. Other embodiments are also possible based on the use of wheels which provide floatation, steering and tracking.

[0060] In another embodiment, a smaller version of the embodiments described above can be used as a personal craft, like a sailboard.

[0061] The invention is to be defined not by the preceding illustrative description or these embodiments, but instead by the spirit and scope of the claims.

Claims

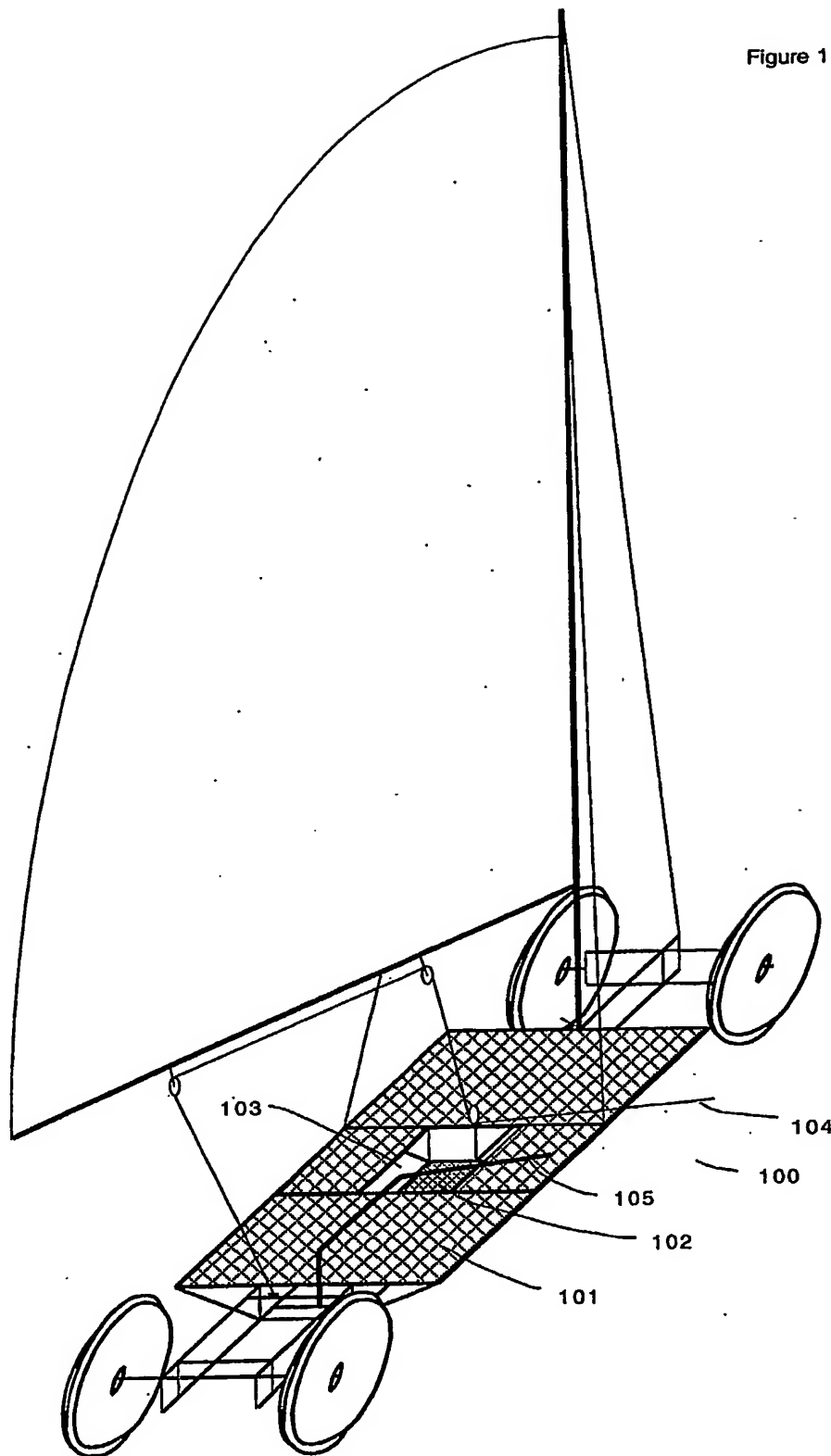
1. A sailing craft, comprising:
a frame;
a sail affixed to the frame;
two buoyant wheels attached to one side of the frame; and
two buoyant wheels attached to the opposite side of the frame.
2. The sailboat, of claim 1, wherein each wheel has a fin on its perimeter.

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Attorney Docket No.: XYP-001PR

Abstract

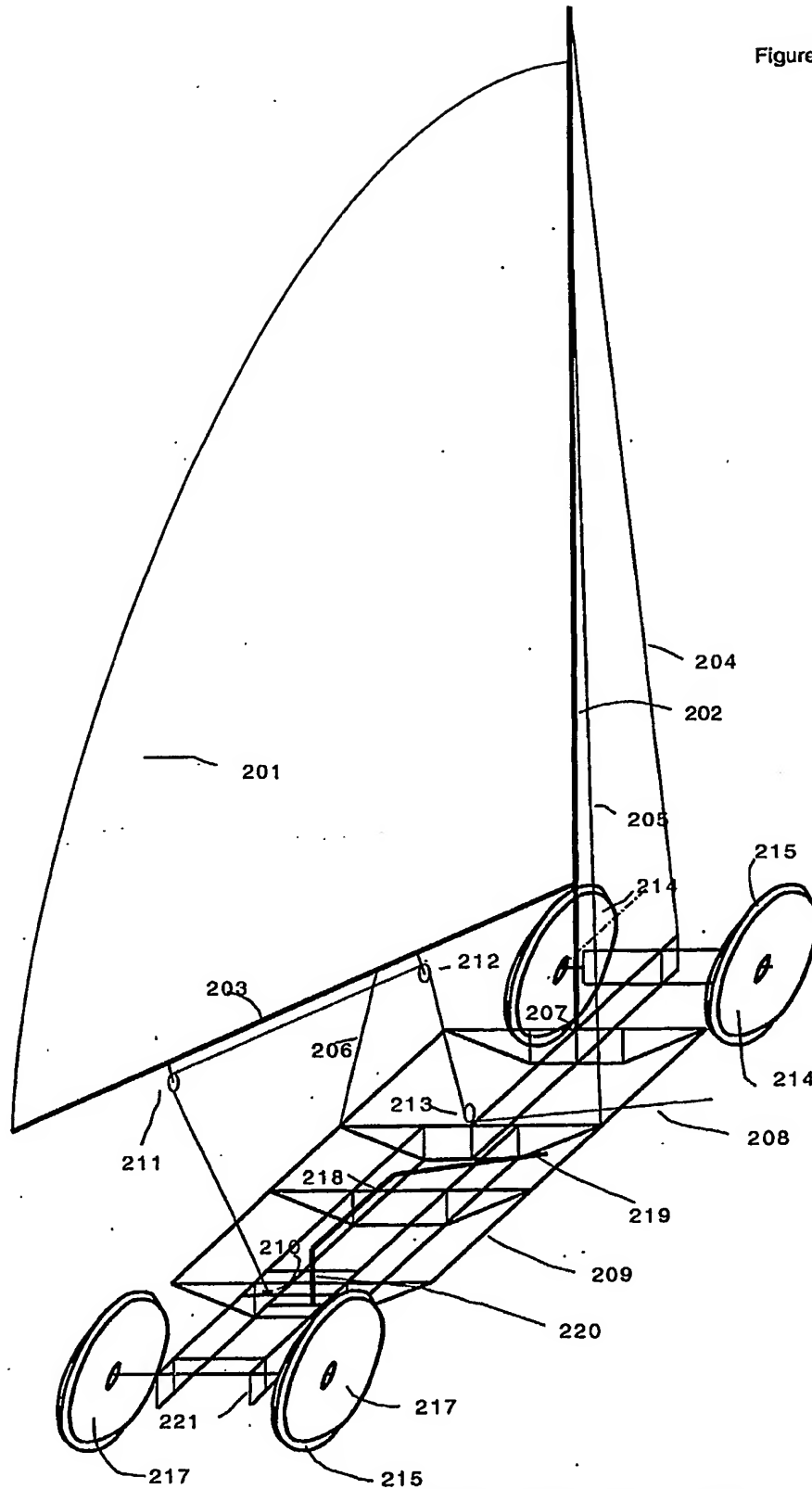
In general, in one aspect, the invention relates to a sailing craft, such as a sailboat, having a frame, a sail affixed to the frame, and four or more buoyant wheels. In one embodiment, the frame has four sides and has a rectangular shape. Two or more buoyant wheels are attached to one side of the frame, and two or more buoyant wheels are attached to the opposite side of the frame. Each buoyant wheel is capable of contributing to at least one of floatation, steering, and tracking. In one such embodiment, some or all of the wheels have a fin or fins on some or all of its perimeter.

Figure 1



Sailing Craft with Wheels by Eveleth
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 Atty/Agent: Ira Heffan
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Figure 2



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 Atty/Agent: Ira Heffan
 Sheet 2 of 5
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 Serial No.: Not yet assigned

Figure 3a

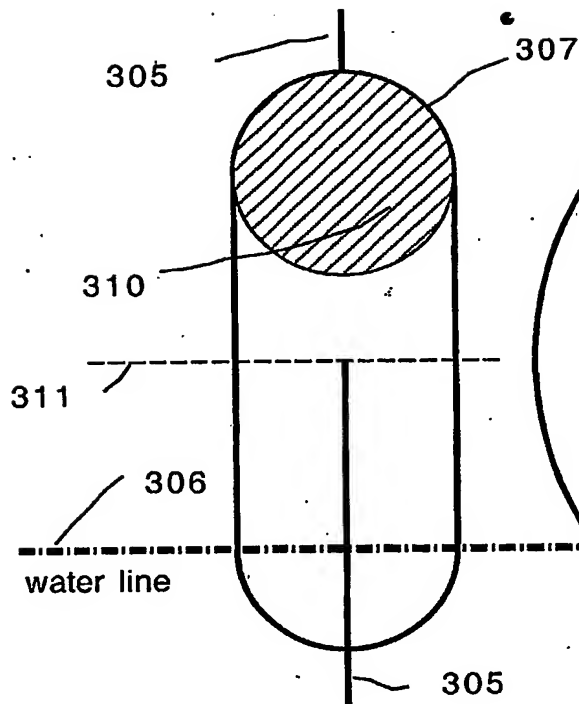


Figure 3b

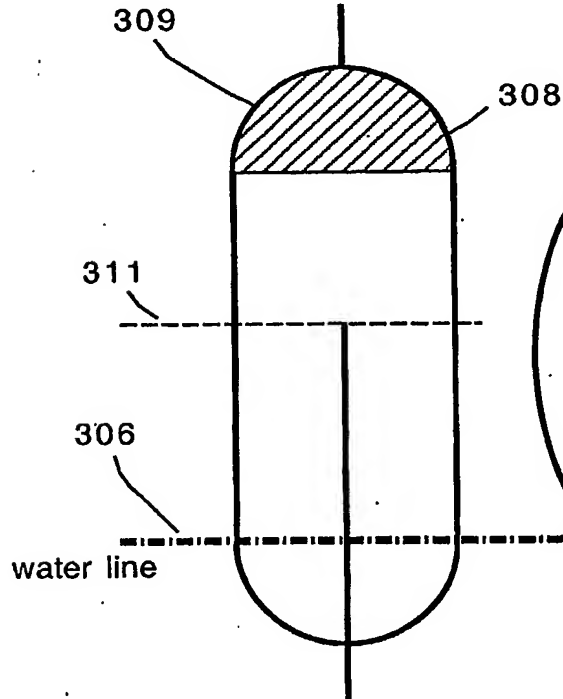
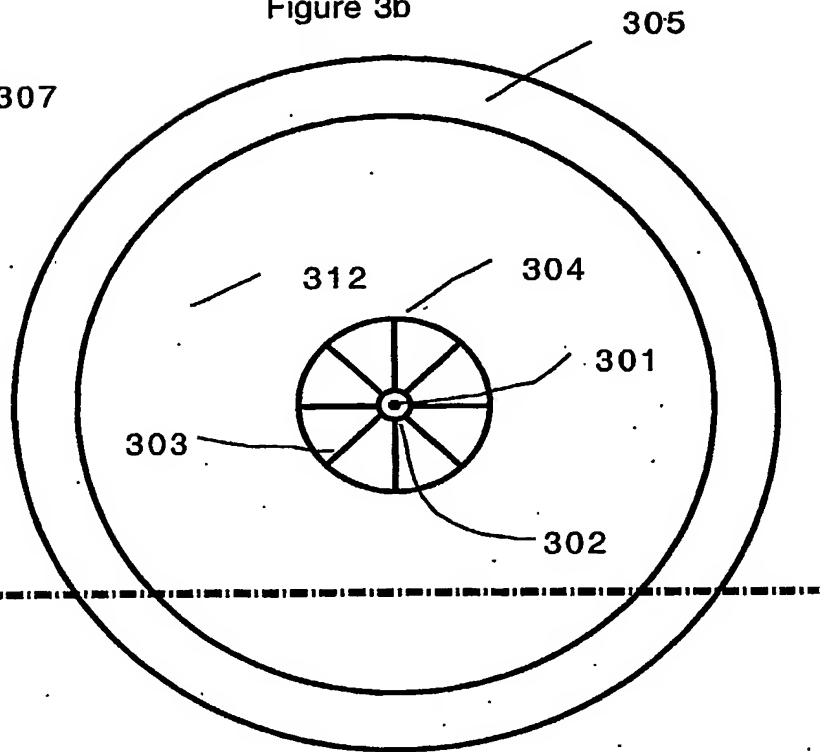


Figure 3c

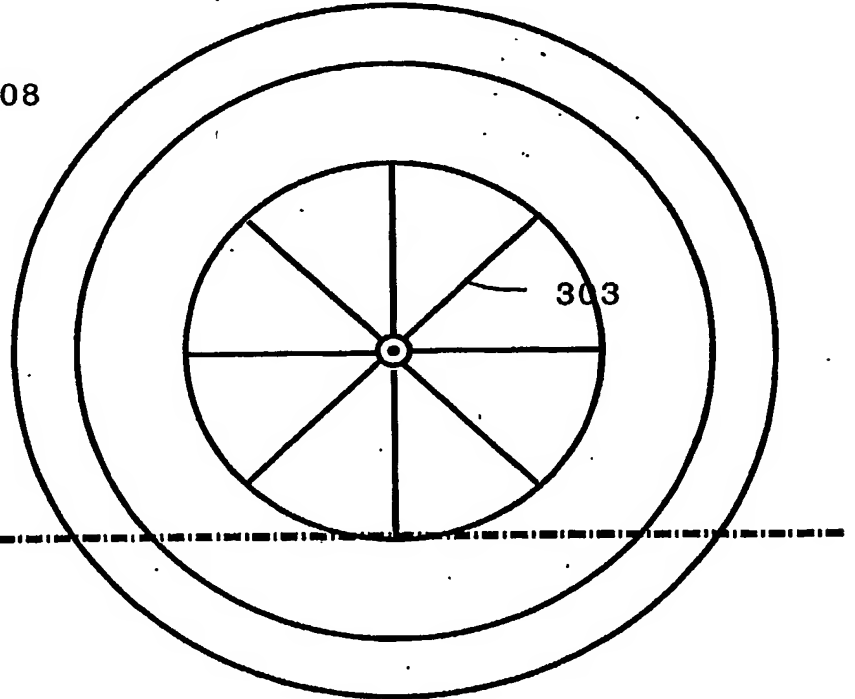


Figure 3d

Sailing Craft with Wheels by Eveleth
 Atty Docket No.: XYP-001PR
 Atty/Agent: Ira Heffan
 Sheet 3 of 5
 EV192309915US
 Serial No.: Not yet assigned



Figure 4a

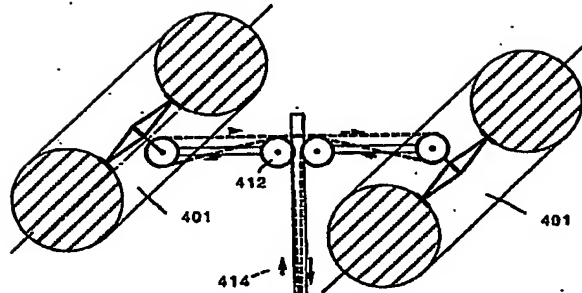


Figure 4f

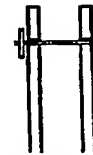


Figure 4b

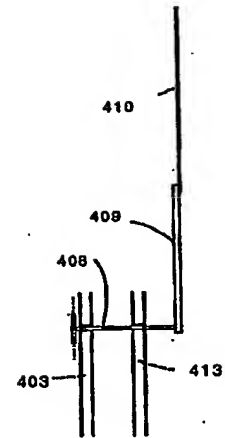
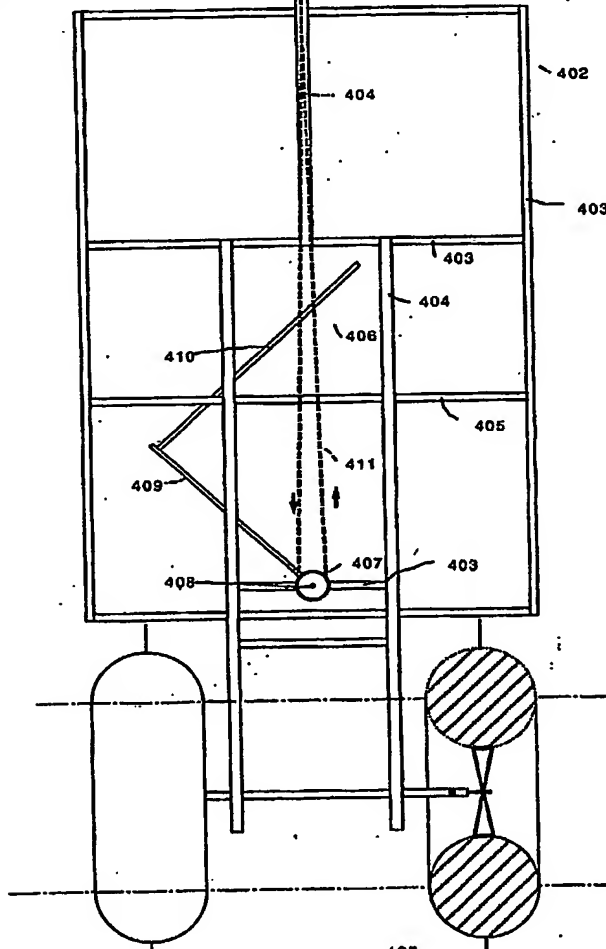


Figure 4e

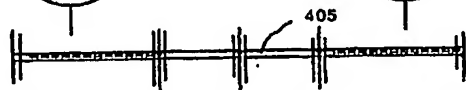


Figure 4c

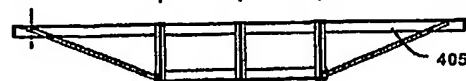


Figure 4d

Sailing Craft with Wheels by Eveleth
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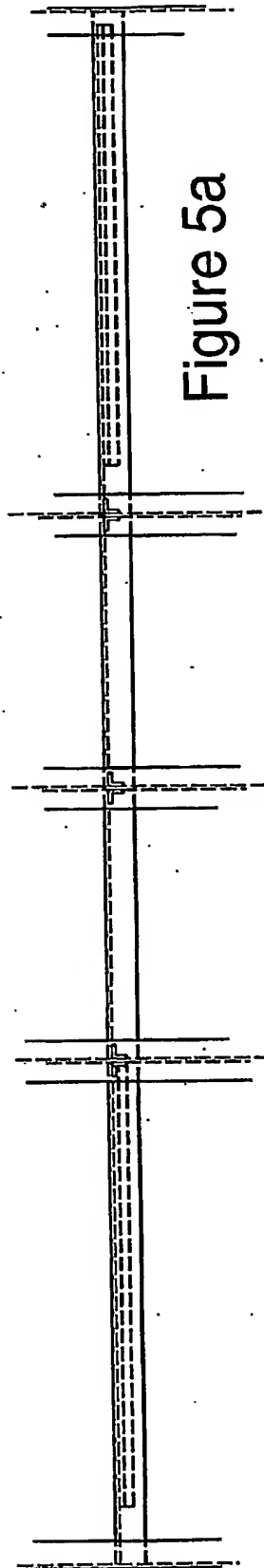


Figure 5a

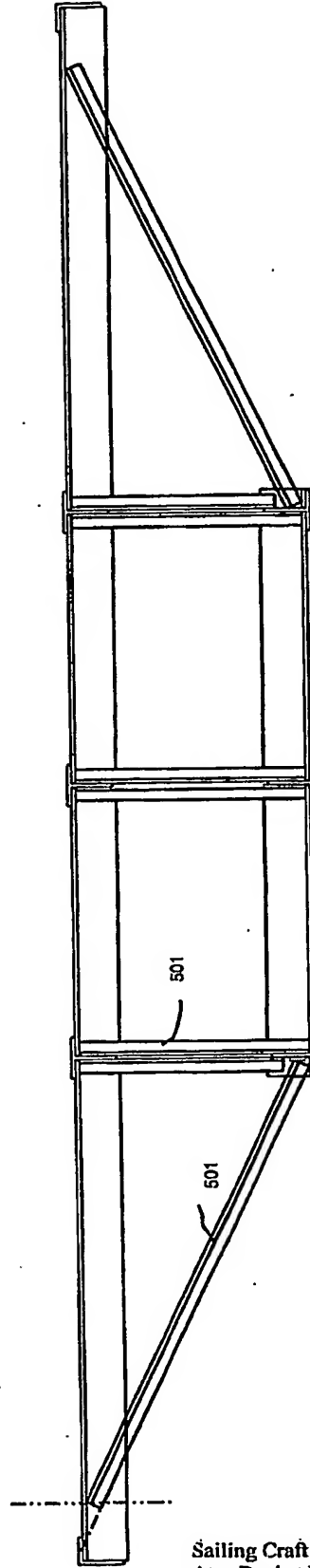


Figure 5b

Sailing Craft with Wheels by Eveleth
Atty Docket No.: XYP-001PR
Atty/Agent: Ira Heffan
Sheet 5 of 5
EV192309915US
Serial No.: Not yet assigned